

**ABSTRACT**

A photonic interconnect system avoids high capacitance electric interconnects by using optical signals to communicate data between devices. The system can provide massively parallel information output by mapping logical addresses to frequency bands, so that modulation of a selected frequency band can encode information for a specific location corresponding to the logical address. Wavelength-specific directional couplers, modulators, and detectors for the photonic interconnect system can be efficiently fabricated at defects in a photonic bandgap crystal.